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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,542	09/23/2003	Akash R. Deshpande	60981-8010.US02	4648

22918 7590 01/11/2007

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EXAMINER	
ZHEN, LI B	
ART UNIT	**PAPER NUMBER**
2194	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/669,542	DESHPANDE, AKASH R.	
	Examiner	Art Unit	
	Li B. Zhen	2194	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *30-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *30-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/23/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Preliminary amendment submitted on 15 April 2004 cancelled claims 1 – 29 and added new claims 30 – 51. Therefore, claims 30 – 51 are pending in the application.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:
Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c). Inventor's post office address was altered but not initialed and dated.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. The abstract contains the phrase "the embodiment of the present invention". These phrases which can be implied should be removed.

4. The specification contains a template for entering "Microfiche Appendix" information [p. 1, lines 15 – 18]. The template should be updated to include microfiche appendix information.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 30 – 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,438,573 to Nilsen [cited in the IDS submitted 04/23/2004] in view of U.S. Patent No. 5,954,792 to Balarin.

7. As to claim 30, Nilsen teaches the invention substantially as claimed including a method of scheduling a plurality of components [real-time tasks] to be performed by a computing device [dispatch real-time tasks according to agreed-upon real-time schedules; col. 22, lines 22 – 32], each component including a plurality of actions suitable for non-preemptive execution by the computing device [An atomic segment is executed either in its entirety or not at all; col. 17, lines 5 – 25], and each action having a scheduled start time [task deadlines; col. 16, line 60 – col. 17, line 5], said method comprising:

determining an earliest start time of the scheduled start times [col. 10, lines 18 – 26];

identifying an earliest component having the earliest action with the earliest start time [each object's atomicity lock be arranged such that information characterizing the time at which a particular request to enter the atomic segment was first issued be stored within the asi argument to enterAtomic( ); col. 17, line 60 – col. 18, line 29]; and

executing a first action of the plurality of actions [col. 22, line 47 – col. 23, line 25] from the identified earliest component to completion without preemption [atomic segment is executed either in its entirety or not at all; col. 17, lines 5 – 26]. Although Nilsen teaches the invention substantially, Nilsen does not specifically teach obtaining a returned event from the executed action and propagating the returned event to a second action from dependent components of the earliest component.

However, Balarin teaches non-preemptive static priority scheduling [col. 5, lines 40 – 46], obtaining a returned event from said executed action in accordance with said executing [Tasks are enabled either by external events or by execution of other tasks (internal events); col. 4, lines 15 – 30]; and propagating said returned event to a second action from dependent components of the earliest component [Events are denoted by ordered pairs (i,j) where j is an internal task and i is either an internal task (in which case the event is said to be "internal"); col. 4, lines 36 – 66].

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Nilsen to include the features of obtaining a returned event from the executed action and propagating the returned event to a

second action from dependent components of the earliest component because this provides efficient methods for verifying the timing behavior of a system in which various tasks are executed on a processor, and each task is enabled in response to the occurrence of an external event and the completion of another task [col. 3, lines 13 – 21 of Balarin].

8. As to claim 38, this is a product claim that corresponds to method claim 30; see the rejection to claim 30 above, which also meets this product claim.

9. As to claim 46, Nilsen as modified by Balarin teaches a system for scheduling [dispatch real-time tasks according to agreed-upon real-time schedules; col. 22, lines 22 – 32 of Nilsen] a plurality of components [real-time tasks of Nilsen], the system comprising:

a computing device configured to receive a plurality of components [col. 22, line 47 – col. 23, line 24 of Nilsen], each component having a scheduled start time [task deadlines; col. 16, line 60 – col. 17, line 5 of Nilsen] and each component including a plurality of actions suitable for non-preemptive execution [An atomic segment is executed either in its entirety or not at all; col. 17, lines 5 – 25 of Nilsen] by the computing device; and

a scheduling program in communication with the computing device [dispatch real-time tasks according to agreed-upon real-time schedules; col. 22, lines 22 – 32 of Nilsen], the scheduling program configured to:

determine an earliest start time of the scheduled start times [col. 10, lines 18 – 26 of Nilsen];

identify an earliest component having the earliest start time [each object's atomicity lock be arranged such that information characterizing the time at which a particular request to enter the atomic segment was first issued be stored within the asi argument to enterAtomic( ); col. 17, line 60 – col. 18, line 29 of Nilsen];

select for execution by the computing device [col. 22, line 47 – col. 23, line 25 of Nilsen], without preemption, a first action of the plurality of actions from the identified earliest component [atomic segment is executed either in its entirety or not at all; col. 17, lines 5 – 26 of Nilsen];

obtain a returned event from said executed action [Tasks are enabled either by external events or by execution of other tasks (internal events); col. 4, lines 15 – 30 of Balarin]; and

propagate said returned event to a second action from the earliest component [Events are denoted by ordered pairs (i,j) where j is an internal task and i is either an internal task (in which case the event is said to be "internal"); col. 4, lines 36 – 66 of Balarin].

10. As to claim 31, Nilsen teaches the plurality of components each have a unique identifier, and wherein a plurality of components each have the earliest start time, the act of identifying the earliest component comprising selecting the earliest component

from the plurality of components having the earliest start time based on the unique identifiers [col. 14, line 28 – col. 15, line 51].

11. As to claim 32, Nilsen teaches the first action is selected based on a predefined preference associated with the first action [priority; col. 22, line 47 – col. 23, line 25].

12. As to claim 33, Nilsen teaches dividing at least one of said components into said plurality of actions [col. 12, lines 1 – 12], wherein each of said plurality of actions are suitable for non-preemptive execution [An atomic segment is executed either in its entirety or not at all; col. 17, lines 5 – 25].

13. As to claim 34, Nilsen as modified by Balarin teaches receiving an interrupt after the act of identifying an earliest start time and before the act of executing [interrupt was scheduled to arrive at time D; col. 18, line 47 – col. 19, line 26 of Nilsen and external events, col. 4, lines 15 – 28 of Balarin], and in accordance therewith serving said interrupt and then performing again the act of identifying the earliest start time [interrupt will be delivered at time D-nsec; col. col. 18, line 47 – col. 19, line 26 of Nilsen], wherein said interrupt corresponds to one of a shell command and a connection request [col. 29, lines 50 – 65 of Nilsen].

14. As to claim 35, Nilsen as modified by Balarin teaches receiving an interrupt after the act of identifying an earliest component and before the act of executing [interrupt

was scheduled to arrive at time D; col. 18, line 47 – col. 19, line 26 of Nilsen and external events, col. 4, lines 15 – 28 of Balarin], and in accordance therewith identifying a component corresponding to said interrupt and a reactive action [task's exception handlers; col. 18, line 47 – col. 19, line 27 of Nilsen] therein, and in accordance therewith executing said reactive action instead of the identified earliest action [col. 10, lines 33 – 45 of Nilsen], wherein said interrupt corresponds to an alert input [col. 6, lines 26 – 47 of Balarin].

15. As to claim 36, Nilsen as modified by Balarin teaches receiving an interrupt after the act of identifying an earliest component and before the act of executing [interrupt was scheduled to arrive at time D; col. 18, line 47 – col. 19, line 26 of Nilsen and external events, col. 4, lines 15 – 28 of Balarin], and in accordance therewith serving said interrupt and then identifying a component corresponding to said interrupt and a reactive action [task's exception handlers; col. 18, line 47 – col. 19, line 27 of Nilsen] therein , and in accordance therewith executing said reactive action instead of the identified first action [col. 10, lines 33 – 45 of Nilsen], wherein said interrupt corresponds to one of a hardware interrupt having an interrupt service routine and a software interrupt having said interrupt service routine [col. 10, lines 33 – 45 of Nilsen].

16. As to claim 37, Nilsen as modified by Balarin teaches each component of said plurality of components further includes a plurality of states [condition; col. 9, line 60 – col. 10, line 14 of Balarin], and the method further comprising: updating one or more

state of said plurality of states related to the earliest component, after said propagating [col. 9, lines 4 – 20 of Balarin].

17. As to claim 39 – 45, these are product claims that correspond to method claims 31 – 37; see the rejection to claims 31 – 37 above, which also meet these product claims.

18. As to claim 47 – 51, these are system claims that correspond to method claims 31 – 34 and 37; see the rejection to claims 31 – 34 and 37 above, which also meet these product claims.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,061,709 to Bronte discloses a system for permitting a software-based executive to execute concurrently with a hardware-based executive.

CONTACT INFORMATION

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li B. Zhen whose telephone number is (571) 272-3768. The examiner can normally be reached on Mon - Fri, 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Thomson can be reached on 571-272-3718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Li B. Zhen
Examiner
Art Unit 2194

LBZ